

## § 121.347

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removal of the equipment for maintenance from another aircraft in the same operator's fleet.

[Doc. No. 6258, 29 FR 19205, Dec. 31, 1964, as amended by Amdt. 121–101, 37 FR 28499, Dec. 27, 1972; Amdt. 121–190, 52 FR 3391, Feb. 3, 1987]

### **§ 121.347 Radio equipment for operations under VFR over routes navigated by pilotage.**

(a) No person may operate an airplane under VFR over routes that can be navigated by pilotage, unless it is equipped with the radio equipment necessary under normal operating conditions to fulfill the following:

(1) Communicate with at least one appropriate ground station from any point on the route.

(2) Communicate with appropriate traffic control facilities from any point within the lateral boundaries of the surface areas of Class B, Class C, Class D, or Class E airspace designated for an airport in which flights are intended.

(3) Receive meteorological information from any point en route by either of two independent systems. One of the means provided to comply with this subparagraph may be used to comply with paragraphs (a)(1) and (2) of this section.

(b) No person may operate an airplane at night under VFR over routes than can be navigated by pilotage unless that airplane is equipped with the radio equipment necessary under normal operating conditions to fulfill the functions specified in paragraph (a) of this section and to receive radio navigational signals applicable to the route flown, except that a marker beacon receiver or ILS receiver is not required.

[Doc. No. 6258, 29 FR 19205, Dec. 17, 1964, as amended by Amdt. 121–226, 56 FR 65663, Dec. 17, 1991]

### **§ 121.349 Radio equipment for operations under VFR over routes not navigated by pilotage or for operations under IFR or over-the-top.**

(a) No person may operate an airplane under VFR over routes that cannot be navigated by pilotage or for operations conducted under IFR or over-the-top, unless the airplane is equipped with that radio equipment necessary

under normal operating conditions to fulfill the functions specified in § 121.347(a) and to receive satisfactorily by either of two independent systems radio navigational signals from all primary en route and approach navigational facilities intended to be used. However, only one marker beacon receiver providing visual and aural signals and one ILS receiver need be provided. Equipment provided to receive signals en route may be used to receive signals on approach, if it is capable of receiving both signals.

(b) In the case of operation over routes on which navigation is based on low frequency radio range or automatic direction finding, only one low frequency radio range or ADF receiver need be installed if the airplane is equipped with two VOR receivers, and VOR navigational aids are so located and the airplane is so fueled that, in the case of failure of the low frequency radio range receiver or ADF receiver, the flight may proceed safely to a suitable airport, by means of VOR aids, and complete an instrument approach by use of the remaining airplane radio system.

(c) Whenever VOR navigational receivers are required by paragraph (a) or (b) of this section, at least one approved distance measuring equipment unit (DME) capable of receiving and indicating distance information from VORTAC facilities must be installed on each airplane when operated in the 50 states and the District of Columbia.

(d) If the distance measuring equipment (DME) becomes inoperative en route, the pilot shall notify ATC of that failure as soon as it occurs.

(e) No person may operate an airplane having a passenger seat configuration of 10 to 30 seats, excluding each crewmember seat, and a payload of 7,500 pounds or less under IFR or in extended overwater operations unless it has, in addition to any other required radio communications and navigational equipment appropriate to the facilities to be used which are capable of transmitting to, and receiving from, at any place on the route to be flown, at

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least one ground facility, two microphones, and two headsets or one headset and one speaker.

[Doc. No. 6258, 29 FR 19205, Dec. 31, 1964, as amended by Amdt. 121-19, 31 FR 6265, Apr. 23, 1966; Amdt. 121-130, 41 FR 47229, Oct. 28, 1976; Amdt. 121-251, 60 FR 65932, Dec. 20, 1995]

**§ 121.351 Radio equipment for extended overwater operations and for certain other operations.**

(a) Except as provided in paragraph (c) of this section, no person may conduct an extended overwater operation unless the airplane is equipped with the radio communication equipment necessary to comply with § 121.349, an independent system that complies with § 121.347 (a)(1), and two long-range navigation systems when VOR or ADF radio navigation equipment is unusable along a portion of the route.

(b) No certificate holder conducting a flag or supplemental operation or a domestic operation within the State of Alaska may conduct an operation without the equipment specified in paragraph (a) of this section, if the Administrator finds that equipment to be necessary for search and rescue operations because of the nature of the terrain to be flown over.

(c) Notwithstanding the requirements of paragraph (a) of this section, installation and use of a single LRNS and a single LRCS may be authorized by the Administrator and approved in the certificate holder's operations specifications for operations and routes in certain geographic areas. The following are among the operational factors the Administrator may consider in granting an authorization:

(1) The ability of the flightcrew to reliably fix the position of the airplane within the degree of accuracy required by ATC,

(2) The length of the route being flown, and

(3) The duration of the very high frequency communications gap.

[Doc. No. 6258, 29 FR 19205, Dec. 31, 1964, as amended by Amdt. 121-253, 61 FR 2611, Jan. 26, 1996; Amdt. 121-254, 61 FR 7191, Feb. 26, 1996]

**§ 121.353 Emergency equipment for operations over uninhabited terrain areas: Flag, supplemental, and certain domestic operations.**

Unless the airplane has the following equipment, no person may conduct a flag or supplemental operation or a domestic operation within the States of Alaska or Hawaii over an uninhabited area or any other area that (in its operations specifications) the Administrator specifies required equipment for search and rescue in case of an emergency:

(a) Suitable pyrotechnic signaling devices.

(b) An approved survival type emergency locator transmitter. Batteries used in this transmitter must be replaced (or recharged, if the battery is rechargeable) when the transmitter has been in use for more than 1 cumulative hour, or when 50 percent of their useful life (or for rechargeable batteries, 50 percent of their useful life of charge) has expired, as established by the transmitter manufacturer under its approval. The new expiration date for replacing (or recharging) the battery must be legibly marked on the outside of the transmitter. The battery useful life (or useful life of charge) requirements of this paragraph do not apply to batteries (such as water-activated batteries) that are essentially unaffected during probable storage intervals.

(c) Enough survival kits, appropriately equipped for the route to be flown for the number of occupants of the airplane.

[Doc. No. 6258, 29 FR 19205, Dec. 31, 1964, as amended by Amdt. 121-79, 36 FR 18724, Sept. 21, 1971; Amdt. 121-106, 38 FR 22378 Aug. 20, 1973; Amdt. 121-158, 45 FR 38348, June 9, 1980; Amdt. 121-239, 59 FR 32057, June 21, 1994; Amdt. 121-251, 60 FR 65932, Dec. 20, 1995]

**§ 121.354 Terrain awareness and warning system.**

(a) *Airplanes manufactured after March 29, 2002.* No person may operate a turbine-powered airplane unless that airplane is equipped with an approved terrain awareness and warning system that meets the requirements for Class A equipment in Technical Standard Order (TSO)-C151. The airplane must